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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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July 31, 2014 14-NWP-155

Ms. Joanne Grindstaff, Federal Project Director
Single Shell Tank Retrieval and Closure
Office of River Protection
United States Department of Energy
PO Box 450, MSIN: H6-60
Richland, Washington 99352

Re: Department of Ecology's Comments on *Hanford C Farm Tank and Ancillary Equipment Residual Waste Inventory Estimates*, RPP-RPT-42323, Revision 2

Dear Ms. Grindstaff:

The Department of Ecology (Ecology) reviewed the referenced document. Ecology's comments are enclosed.

Ecology requests comment dispositions by September 30, 2014. We request comment resolution meetings and a revised document that incorporates the resolution of our comments. We expect that this document will be incorporated in the *Waste Management Area C Performance Assessment*.

If there are any questions regarding this letter, please contact me at jeff.lyon@ecy.wa.gov or (509) 372-7914, or Beth Rochette at beth.rochette@ecy.wa.gov or (509) 372-7922.

Sincerely,

Jeff Lyon
Tank Waste Storage Project Manager
Nuclear Waste Program

br/jc
Enclosure

cc electronic w/enc:
Dennis Faulk, EPA
Ken Niles, ODOE

cc w/enc:
Christopher Kemp, USDOE
Marcel Bergeron, WRPS
Susan Eberlein, WRPS
Stuart Harris, CTUIR
Gabriel Bonnee, NPT
Russell Jim, YN
Steve Hudson, HAB
Administrative Record
Environmental Portal
USDOE-ORP Correspondence Control

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
3. Project: WMA C PA	4. Page

5. Document Number(s)/Title(s)	6. Project Manager Name	7. Reviewer Names: Mike Barnes, Joe Caggiano, Michelle Hendrickson, Jared Mathey, Beth Rochette, Nancy Uziemblo	8.	9.
Hanford C Farm Tank and Ancillary Equipment Residual Waste Inventory Estimates, RPP- RPT-42323, Rev. 2 – Redline				

12. Project Manager	10. Agreement with indicated comment disposition(s)	11. Second review
	Reviewer/Point of Contract	Reviewer/Point of Contact
13. Project manager (second review)	Date / Author/Originator	Date / Author/Originator

Comment	Section, Page, Paragraph	Comment and Modification Needed	Disposition (Provide justification if NOT accepted.)	16. Status
1.	General	SST residual waste inventory should be determined from the retrieval data report samples taken from those SSTs having completed retrieval. There is no need to estimate or calculate this residual inventory if there is a sample taken. This is stated in section 3.2, d. (NU)		
2.	General	Heavy reliance is placed on modeling to estimate inventories. While it may be the best available data, what is being done to validate the models with real sample or characterization data? What is the uncertainty in these data and how is this uncertainty incorporated into the PA model? Please comment. (JC)		
3.	Exec. Summary, p. i., 1st paragraph	For the last sentence, I would add the word "soluble" contaminant remaining in the tanks. If it hasn't been retrieved and is thus relatively insoluble and the tank is		

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		filled with grout, the likelihood of release to the soil is low. The linearity between residual inventory and risk is questionable. Please clarify. (JC)		
4.	Exec. Summary, bullet 2	Add the term "ancillary equipment" to the bullet, since the listed items constitute ancillary equipment per WAC 173-303-040. (JC)		
5.	Exec. Summary, p. i., 2nd paragraph	C-106 retrieval determination is undergoing Appendix H of the TPA procedure and not considered completed. This should be stated in the text and not grouped in with the other tanks that are considered completed. (NU)		
6.	Exec. Summary, p. i., last paragraph	SSTs C-102 and -105 are presently on the schedule to NOT meet the Sept. 30, 2014 Consent Decree milestone. Ecology has been informed of this delay. Reword to give new predicted completion dates. (NU)		
7.	Exec.Summary, p. ii, Figure ES-1	There is a key term missing in Figure ES-1 for the green dotted line tanks and the term used for the red dotted line appears in between the two key terms. Fix missing information in figure ES-1. (JM)		
8.	Exec. Summary, p. iii, last paragraph (and Figure ES-2 and Figure 2-2, center row)	SST waste retrieval goal is 360 ft3 or less. Bullet #3, stating 99% or 90% of the waste is removed will apply to catch tanks or other ancillary equipment. (NU)		
9.	Exec. Summary, p. iii, last paragraph	Predicating residual waste inventories from BBI estimates is not always a linear assumption. Confirm all updated residual estimates now use HTWOS modeling for predicted waste inventories. (NU)		

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10.	Exec. Summary, p. v	For catch tanks and pipelines won't there be some residual waste sampling data? Shouldn't that go in the inventory estimates? What is the technical basis for the statement that pipeline residual inventory estimates are likely low and of little risk consequence? Have camera surveys been run through any pipelines to provide some validity to this assumption? The assumed low inventory in pipelines should be verified before this assumption is carried forward. Please address. (JC)		
11.	Exec. Summary, p. v-vi, Table, and Section 2, Table 2-1	Please revise these tables considering our comments on the body of the document. (BR)		
12.	Executive Summary, p. v, Table	In the top of the table at the bottom: 241-C-210 should be changed to 241-C-201. Fix error in tank names retrieved. (JM)		
13.	Executive Summary, p. vii, Table	Mike Barnes during a PA dry run meeting provided two papers conducted in 1999 and 2000 which have better estimates for the 244-CR Vault. 244-CR Vault Interim Stabilization Project Plan RPP-6029 Rev. 0 and Hazard Evaluation for 244-CR Vault HNF-4215 Rev. 0. Ecology requests that information from these reports be used for contaminant assumptions for the PA for the 244-CR Vault. Use more accurate estimate assumptions for the 244-CR Vault. (JM)		
14.	Section 1.1. p. 1-1, a.	Specify that this is as of January 1, 2014 and also remove the second dash in the last sentence in C-103. Use a date for report clarity and fix error. (JM)		

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15.	Section 1.2.2, p. 1-6 to 1-9, vs Table 4-3	Revise the text to include the additional waste that has been routed to 241-C Tank Farm from historical Semiworks and B-Plant operations that are not currently included. These operations (and references) include: • The Hot Semiworks Valve Pit (HSVP) constructed in 1951 was used to route waste (REDOX and PUREX trial runs) to the 244-CR Vault and 241-C Tank Farm Tanks from Semiworks (WIDS, DOE/RL-92-18 pg. 2-21) • Rare Earth metal recovery waste from Semiworks and B-Plant including promethium recovery campaign waste via the 241-C-154 diversion box in 1967 (WIDS, DOE/RL-92-18 pg. 2-22, ISO-100, pg 958) • REDOX waste routed to 241-C Tank Farm between 1952-1953 (DOE/RL-92-18 pg. 2-26) Also, modify text in this section as it is in disagreement with Table 4-3 which does list these additional historical process operations, including waste from B Plant and PUREX (second to last sentence in first paragraph of 1.2.2.4). (MH)		
16.	Section 1.2.3, p. 1-9	The interim stabilization criteria also include having less than 5 kilogallons of supernatant. Add this criterion. (NU)		
17.	Section 1.2.3, p. 1-9	Some tanks were administratively interim stabilized. Remove 'all' from 3rd sentence. (NU)		
18.	Section 1.2.3, p. 1-9 last line – p. 1-10 top line	Some SSTs presently exceed the interim stabilization criteria. Remove last sentence of section 1.2.3. (NU)		

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19.	Section 1.2.4, p. 1-10, 2nd paragraph	Waste retrieval has started for C-102 and C-105. Update status of C-102 and C-105 in text. (NU)		
20.	Section 2, p. 2-1, Table 2-1	According to WIDS, the C-301 Tank contains 10,480 gallons of sludge and supernatant alone. WIDS did not list a volume for the 4 tanks in the CR-Vault. However, RPP-49049, Rev. 0 states that • Tank CR-011 tank contains 3990 gallons of sludge (36.2 inches) and no liquid • Tank CR-001 contains 932 gallons of liquid (17.2 inches) and 245 gallons of sludge (2 inches) • Tank CR-002 contains 270 gallons of liquid (11 inches) and 245 gallons of sludge (7.5 inches) • Tank CR-003 contains 1,432 gallons of liquid (16 inches) and 714 gallons of sludge (18 inches) It is doubtful that the base case and alternate cases are accurate for the C-301 Tank and all of the CR Vault. (MH)		
21.	Section 2, p. 2-1, Table 2-1	In the top of the table at the bottom. 241-C-210 should be changed to 241-C-201. Fix error in tank names retrieved. (JM)		
22.	Section 2, p. 2-1, Table 2-1, Unretrieved Tanks	There are some tanks (notably C-108, C-112) that have high inventories of certain constituents that are bound up and unlikely to be retrieved, as the waste is hard, insoluble, and difficult to disaggregate. Retrieval is unlikely, yet the residual waste substantially exceeds the assumed 360 cu ft. To call 360 cu ft the sensitivity case seems unrealistic. Please address. (JC)		

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23.	Section 2, p. 2-1, Table 2-1	For retrieved tanks, clarify if denominator case's use of BBI data is the same as the sensitivity case's Retrieval Data Report Inventories. After sampling a tank for the Retrieval Data Report sample, the analytical results should be downloaded to BBI. (NU)			
24.	Section 2, p. 2-2, Table 2-1	Why wasn't the Pipeline FS (RPP-PLAN-47559, Rev.1) mentioned as a basis for the estimates of the pipeline volumes? (It is cited in section 4.4.4). Include these data in the ancillary equipment and piping residual inventory cases. (MH)			
25.	Section 2, p. 2-2, Table 2-1	The pipeline inventory, based on retrieved tanks, is not meaningful for plugged pipelines. We request that the inventory be based on the tanks prior to retrieval for the plugged pipelines. (MH, JM)			
26.	Section 3, p. 3-1, 1st paragraph	Why list item a), as this information is a decade or more old and has been superseded? Please address. (JC)			
27.	Section 3.1, p. 3-1, c)	If a normally soluble constituent is chemically bound so as to be unlikely to be retrieved, why make this assumption? Please address. (JC)			
28.	Section 3.2, Section 4.4 and Section 5	I do not agree with using the waste residuals of retrieved SSTs to calculate the inventories for SSTs which have not been sampled or retrieved for the following reasons: • It is known that not all SSTs will have a volume of 360 cubic feet. I note tanks C-111 and C-112 will have significantly more than 360 cubic feet thus all residuals constituents are biased low utilizing your method. Other tanks such as C-102, C-105 and C-107 may also. • The waste types, waste chemistry and			

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		concentrations, temperatures, and solids precipitating events are different and unique • The mineral formation within tanks of similar chemistry maybe very different; for example tanks c-108 and c-109 had similar hard heel minerals but C-110 had a totally different hard heel mineralogy • Methods of retrieval, retrieval efficiency, and particle size are different I specifically do not agree with the technetium-99 estimates used: • Tank C-107 had a very high iron content; there is a concern that tank C-107 could have a much higher technetium-99 content because the technetium has been incorporated into the iron and has not flushed out. • Tank C-112 had very high initial technetium-99 content especially the first cycle waste at the tank bottom. It will NOT be known until sampling and analytical results are available what the Tc-99 content is. The water used at the end of retrieval did not fully cover the residuals thus; a much higher amount of technetium-99 could remain than you have shown in your tables. This under estimation of technetium-99 will not provide information Ecology may need in evaluating a decision on foregoing a third technology in this tank. • I think to aid in evaluating potential residual technetium-99 issues with tank C-105 a poor retrieval estimate of technetium-99 should be used. Say 20 curies. Vault cells		

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		• For the vault cells/tanks Ecology would like to know the solids content as the tanks sit now so a cost/benefit of their retrieval could be compared versus cost/benefit of further retrieval of another tank. • Specific vault cells were used for specific purposes and thus not reflective of SST residuals. Diversion boxes • I doubt the diversion boxes are clean and contain no contamination. An estimate was provided in the engineering estimate. (MB)		
29.	Section 3.2, p. 3-2, f)	Can you validate the assumption that the residual in pipelines is represented by the average waste in C Farm tanks? Please address. (JC)		
30.	Section 3.2, p. 3-2, bottom of page	What about water additions during tank operations to keep the waste cooled below threshold values? Is this included? Under the RCRA mixture rule, it becomes waste. Please address. (JC)		
31.	Section 3.2, p. 3-3, last paragraph of section	What is the basis for this statement if you do not have any validation data to verify the assumption? Please address. (JC)		
32.	Section 3.2, p. 3-3, last paragraph of section	The text states "Pipeline residual estimates are also uncertain; however, even upper bound pipeline residual waste estimates (Chapter 5) contribute a small amount to the C-Farm residual inventories compared to SSTs and catch tank residuals." Pipelines will eventually corrode and contribute waste to the shallow subsurface, and pose a potential direct contact and ecological risk that may		

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		exceed that of other near-surface contamination. Please add the following text: 'Nonetheless, due to their shallow depth in the subsurface, pipelines are a potential risk to human health through direct contact and to ecological receptors, if they are breached or release contamination through corrosion in the future.' (BR)		
33.	Section 3.3, p. 3-5, Table 3.1, EDTA	Why isn't this constituent analyzed, as it is a complexing agent that results in greater mobility for some metal contaminants? Please address. (JC)		
34.	Section 4, General	Inventories for the following constituents will be needed in the PA, due to their presence in the tank residuals from retrieved tanks: Acetate (C-104, C-202, C-203) Acetone (C-103, C-109, C-202, C-203, C-204)[bc] Aluminum (C-103, C-104, C-108, C-109, C-202, C-204)[b] Am-241 (C-103, C-104, C-108, C-109, C-202, C-203, C-204)[bc] Ammonium (C-103, C-104, C-108, C-109, C-202, C-204) Aroclors (total PCBs) (C-104, C-108)[abc] Arsenic (C-109)[abc] Barium (C-103, C-104, C-108, C-109, C-202, C-203, C-204)[ab] Benzene (C-104)[abc] Beryllium (C-103, C-104, C-204)[abc] Bismuth (C-104, C-109, C-202, C-203) Boron (C-103) 1-Butanol (C-104) 2-Butanone (C-103, C-202, C-203, C-204)[abc]		

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		Butylbenzylphthalate (C-103)[abc] C-14 (C-103, C-104)[c] Cadmium (C-103, C-104, C-202)[abc] Cerium (C-103, C-104, C-109) Cm-242 (C-104, C-108)[c] Cm-243 (C-104, C-108)[c] Cm-244 (C-104, C-108)[c] Cs-137 (C-103, C-104, C-108, C-109, C-202, C-203, C-204)[bc] Chlorine (incl. chloride) (C-103, C-202, C-203, C-204) Chromium (C-103, C-104, C-108, C-109, C-202, C-203, C-204)[bc] (Cr(VI))[bc] Cobalt (C-104, C-202, C-203)[bc] Copper (C-103, C-104, C-108, C-109, C-202, C-203)[bc] Cyanide (C-103,C-109, C-202)[abc] 1,2-Dichlorobenzene (C-110)[abc] Di-n-butylphthalate (C-103, C-204)[abc] Ethylbenzene (C-104)[bc] Europium (C-103, C-202, C-203) Eu-154 (C-103)[c] Fluorine (incl. fluoride) (C-103, C-104, C-108, C-109, C-202, C-203, C-204)[abc] Formate (C-104, C-202, C-203) Hexone (C-103, C-202)[abc] I-129 (C-103, C-202, C-203)[c] Lanthanum (C-103, C-109) Lead (C-103, C-104, C-108, C-109, C-203, C-204)[abc] Lithium (C-104, C-109) Manganese (C-103, C-104, C-108, C-109, C-202, C-203,		

Comment	Section, Page, Paragraph	Comment and Modification Needed	Disposition (Provide justification if NOT accepted.)	16. Status
		C-204)[bc] Mercury (C-103, C-104, C-108, C-109, C-202, C-203, C-204)[abc] Methylene chloride (C-104)[abc] Molybdenum (C-103, C-104, C-109) Neodymium (C-103, C-104, C-109) Niobium (C-104) Np-237 (C-103, C-202, C-204)[bc] Nickel (C-103, C-104, C-108, C-109, C-202, C-203, C-204)[abc] Ni-63 (C-103, C-104, C-108, C-109, C-202, C203, C-204)[c] Nitrate (C-103, C-104, C-108, C-109, C-202, C-204)[b] Nitrite (C-103, C-104, C-108, C-109, C-202, C-204)[b] Oxalate (C-103, C-104, C-108, C-202, C-204) Palladium (C-103, C-104)[b] Pu-238 (C-103, C-104)[bc] Pu-239/240 (C-103, C-104, C-108, C-109, C-202, C-203, C-204)[bc] Pu-241 (C-104, C-108, C-109)[bc] Praseodymium (C-103, C-104, C-202, C-203) Ruthenium (C-103, C-109) Samarium (C-109) Se-79 (C-108)[c] Silver (C-103, C-104, C-109)[abc] Sn-126 (C-104)[c] Strontium (C-103, C-104, C-108, C-109, C-202, C-203, C-204) Sr-90 (C-103, C-104, C-108, C-109, C-202, C-203, C-		

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		204)[bc] Sulfate (C-103, C-104, C-108, C-109, C-204) Sulfur (C-103, C-202) Tantalum (C-104) Tc-99 (C-103, C-104, C-108, C-109, C-203, C-204)[c] Tellurium (C-104) Thallium (C-104, C-108, C-109)[abc] Thorium (C-104, C-103, C-108, C-109, C-202, C-204)[b] Th-228 (C-108, C-109)[bc] Th-232 (C-103, C-104, C-108, C-109, C-202, C-203, C-204)[c] Tin (C-103, C-104, C-202) Titanium (C-103, C-104, C-108, C-109, C-202, C-203, C-204) Toluene (C-104)[abc] Tributylphosphate (C-103, C-202, C-203, C-204) 1,2,4-Trichlorobenzene(C-110)[abc] Tritium (C-103)[c] Tungsten (C-104) Uranium (C-103, C-104, C-108, C-109, C-202, C-203, C-204)[b] U-isotopes (C-103, C-104, C-108, C-109, C-202, C-203, C-204)[bc] Vanadium (C-104)[b] Xylene (m, o, p, total) (C-110, C-203)[bc] Yttrium (C-103, C-104, C-108, C-109) Y-90 (C-104, C-108)[c] Zinc (C-103, C-104, C-108, C-109, C-202, C-203, C-204)[bc]		

Comment	Section, Page, Paragraph	Comment and Modification Needed	Disposition (Provide justification if NOT accepted.)	16. Status
		Zirconium (C-103, C-108, C-202, C-203) [a] = state dangerous waste list [b] = ATSDR (federal) priority list of hazardous substances (CERCLA) [c] = EPA list of hazardous substances and reportable quantities (40 CFR Ch. I, Table 302.4) (BR)		
35.	Section 4.0 and 4.1	Additional chemical constituents and radionuclides should be included for the estimation/calculation of tank and ancillary equipment residuals per the additional wastes received by the 241-C Tank Farm. These chemical constituents and radionuclides include: • $NaNH_3$ • Zr • CrO_4 and Cr_2O_7 • Hexone or MIBK and degradation products • TBP and degradation products • NPH or kerosene (dodecane) • Di-2-ethyl-hexyl phosphoric acid • Cerium-144 • Promethium-147 • Sulfamate • Lanthanum/neodymium nitrate (REN) • Phosphotungstic Acid (PTA) While most of these constituents are included on one table or another in Section 3 and Table 4-2, it is not clear that the constituents will be included in the inventory		

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		estimates for the WMA C PA. Clarify and add in these and other constituents listed in Table 4-2. (MH)		
36.	Section 4.1.3, p. 4-8, 1st paragraph of section	Explain the meaning of "template concentrations" and how they were derived. Sounds as if these are then projected to tanks where there is insufficient sample data. Please address. (JC)		
37.	Section 4.2, p. 4-9, Table 4-4	Latest retrieval results can be used to update the sludge and supernatant for C-102 and C-105. (NU)		
38.	Section 4.4, p. 4-14, Figure 4-3	One can calculate the volume of the pipe cylinders, but how does one estimate the volume of waste that is in these pipelines if they aren't full? There must be some assumption(s) regarding how "full" these pipelines are. Please explain. (JC)		
39.	Section 4.4.3, p. 4-15	Unless diversion boxes are going to be sampled to verify that they will meet clean closure standards, some sort of estimates of contamination will be needed for diversion boxes. Diversion boxes may contain little contamination, however there are contaminants left in diversion boxes and a conservative estimate needs to cover the potential contamination in diversion boxes if this model is going to be used as a case that will be applied to closure plans and requirements for a good corrective measures study. Also see a prior comment on Section 3.2, 4.4 and 5, regarding diversion boxes. (JM)		
40.	Section 4.4.4, p. 4-16, 4th paragraph	The non-pressurized vitrified clay pipe seems an illogical analog for pressurized pipelines in a tank farm. Please justify. (JC)		

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41.	Figure 5-2 and Section 4.4.4	Text in the figure (bottom line) states that the average length and width of pipelines would be calculated in Section 4.4.4. However, no average width was stated in the text. Will 4.25 inches be used as referenced in RPP-PLAN-47559, Rev.1 be used? Will 7 miles be used? Clarify these values in section 4.4.4. (MH)		
42.	Section 5.2.1.6, p. 5-13, Fig 5-7	Is this a composite of videos on two different dates, or is the reader supposed to distinguish one month from another? Please clarify. (JC)		
43.	Section 6.0, p. 6-1, 2nd paragraph	Ecology does not agree that "pipeline residual inventory estimates …will have minor impacts on risk calculations." Pipelines are located much closer to the surface than tank residuals and other ancillary equipment. Thus, direct contact to these residuals could create a larger risk pathway. Delete this portion of the sentence. (MH)		
44.	Section 6, p. 6-1, 2nd paragraph	Please see prior comments on pipeline residual inventory estimates and modify accordingly. (JC)		
45.	Section 6.1.1.2, p. 6-3, Table 6-1	Table 6-1 should be consistent with Table 4-3 and complete. Please correct. (JC)		
46.	Appendix D (from clean copy of document), Table D-1.1, p. D-5 – D-54	Delete the column "Dangerous Waste Constituent" as this list is not inclusive of all types of dangerous wastes listed in WAC 173-303. The SST Part A lists all of the Dangerous Waste Codes for the SST System. This is the list of dangerous wastes that are associated with the dangerous waste management units and is what need to be tested for. So, for example, n-Butyl alcohol (1-butanol) is a F003 listed waste, but it is not found in		

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		WAC 173-303-9905. (JM)		
47.	Appendix D, Table D-1.1, p. D-5 – D-54	Please delete the 'Dangerous Waste Contituent' column. Many constituents that are not listed as 'Dangerous Waste Constituents' are equally important, as they are on federal lists of hazardous substances. The contaminants below were found in tank residuals and are on at least one federal hazardous substance list: Acetone[bc] Aluminum[b] Am-241[bc] Aroclors (total PCBs)[bc] Arsenic[bc] Barium[b] Benzene[bc] Beryllium[bc] 2-Butanone[bc] Butylbenzylphthalate[bc] C-14[c] Cadmium[bc] Cm-242[c] Cm-243[c] Cm-244[c] Cs-137[bc] Chromium[bc] (Cr(VI))[bc] Cobalt[bc] Copper[bc] Cyanide[bc]		

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		1,2-Dichlorobenzene[bc] Di-n-butylphthalate[bc] Ethylbenzene[bc] Eu-154[c] Fluorine (incl. fluoride)[bc] Hexone[bc] I-129[c] Lead[bc] Manganese[bc] Mercury[bc] Methylene chloride[bc] Np-237[bc] Nickel[bc] Ni-63[c] Nitrate[b] Nitrite[b] Palladium[b] Pu-238[bc] Pu-239/240[bc] Pu-241[bc] Se-79 (C-108)c Silver[bc] Sn-126[c] Sr-90[bc] Tc-99[c] Thallium[bc] Thorium[b] Th-228[bc] Th-232[c]		

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		Toluene[bc] Tributylphosphate[d] 1,2,4-Trichlorobenzene[bc] Tritium[c] Uranium[b] U-isotopes[bc] Vanadium[b] Xylene (m, o, p, total)[bc] Y-90[c] Zinc[bc] [b] = ATSDR (federal) priority list of hazardous substances (CERCLA) [c] = EPA list of hazardous substances and reportable quantities (40 CFR Ch. I, Table 302.4) [d] = tributylphosphate, carcinogen in PPRTV database (BR)		
48.	Appendix D, Table D-1.1, p. D-5 – D-54	Please provide an explanation in this document as to why many of the analytes listed in the SST Part A were not analyzed in the final end of retrieval sampling. Please cite section of the DQO (or SAP) which allows for this type of sampling to not take place. For purposes of closure, all waste codes listed in the Part A need to be sampled [WAC 173-303-610(3)(a)(v)]. For example: Methanol is a F003 listed waste and is included in the SST Part A; however, it is missing from the list of analytes that were tested as a part of the retrieval sampling. Also for C-103, 1,1-Dichloroethene was listed but not tested. This analyte is listed in the Part A under		

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		the D029 Dangerous Waste Code, but was not tested.in the Part A need to be sampled [WAC 173-303-610(3)(a)(v)]. (JM)		
49.	Appendix D, Table D-1.1, p. D-5 – D-54	Include in the table the average composition (in mg/kg or ug/g) of C-Farm waste, as proposed for pipelines and ancillary equipment (in Table 2-1), including all of the measured constituents. Ecology will need to compare the composition with direct contact and ecological protection values, since the pipelines and ancillary equipment are above 15 ft bgs (the standard point of compliance in WAC 173-340 for direct contact and ecological protection). A release model would involve corrosion of the pipes or structures, resulting in deposition of the contents in the soil. We will also consider groundwater protection. Using information from Table D-1.1 for retrieved tanks the following chemical contaminants appear to be above direct contact values in at least one tank: Aluminum Cadmium Chromium (assuming hexavalent) Cobalt Fluoride Lead Manganese Mercury Molybdenum Nickel PCBs		

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Comment	Section, Page, Paragraph	Comment and Modification Needed	Disposition (Provide justification if NOT accepted.)	16. Status
		Silver Thallium Tributyl Phosphate Uranium Ecological (at least one tank): Antimony Barium Boron Cadmium Chromium Lead Manganese Mercury Molybdenum Silver Thallium Uranium (BR)		